



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|--------------------------|------------------------|
| 10/774,115 | 02/06/2004 | Glen C. Shepherd | Solectron 735 | 8375 |
| 7590 | | 07/23/2008 | | |
| Robert Moll 1173 St. Charles Court Los Altos, CA 94024 | | | EXAMINER DINH, TUAN T | |
| | | | ART UNIT 2841 | PAPER NUMBER |
| | | | MAIL DATE 07/23/2008 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/774,115

Applicant(s)

SHEPHERD ET AL.

Examiner

Tuan T. Dinh

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
4a) Of the above claim(s) 30-33 and 35 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-29 and 34 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 06 March 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/808)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 11 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 11, and 25, lines 1-3 are unclear. The phrase of "the substrate...further comprising a surface mounted (SMT) component electrically connected to the conductive pad" is not understood because as claimed in claims 1 and 14 and also in figures 3-4 there is "a SMT component (as in claimed 1 and 14) is electrically connected to the pad. Why two components can connected to the conductive pad.? It is contradiction. Please, clarify the claims.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 9-15, and 22-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lauffer et al. (U.S. Patent 5,811,736) in view of Dishongh ('31) as in the record.

As to claims 1-2, 11-13, Lauffer et al. discloses a PCB (10) or a part of BGA package footprint having a substrate (12) as shown in figures 4-6, the substrate comprising:

A SMT component (46) having terminals (44), see figure 6 mounted on a conductive layer (20) of the substrate (12), a conductive pad (138) having a trace (139), and a solder resist/mask (53), the solder mask (53) covers a part of the pad (the mask mounted on the trace (139)), the component (46) connected to the substrate by a solder (55), the solder formed between the terminal (44) of the component (46) and the solder mask (53).

Lauffer et al. does not disclose the solder mask surround a plated via, and the plated via connected to the trace.

Dshough discloses a substrate (120) having a solder mask (160) surrounding a plated via (130 having plated 132) connected to conductive layers (not show, but the PCB 120 having plurality of conductor layers, see column 1, lines 30-32), a conductive pad (122, 124) with a conductive trace connected to the plated via (130).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Dshough employed in the substrate or PCB (10) of Lauffer in order to protect the solder slash and prevent short circuit when the component connected to the substrate by the solder.

As to claims 14-15, 25, 26, Dishongh et al. discloses a PCB (10) or a part of footprint as shown in figures 4-6, comprising: a SMT component (46) having first and second terminals (44) soldered (55) and mounted on substrate (12), first and second conductive layers (20), first and second solder masks (53, figure 6 shows the solder mask 55 formed on the right side of the substrate 12); first and second conductive pads (138) each with a conductive trace (139), the solder mask (53) cover the solder (55) at the first and second terminals (44).

Dshough discloses a substrate (120) having a solder mask (160) surrounding a plated via (130 having plated 132) connected to conductive layers (not show, but the PCB 120 having plurality of conductor layers, see column 1, lines 30-32), a conductive pad (122, 124) with a conductive trace connected to the plated via (130).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Dshough employed in the substrate or PCB (10) of Lauffer in order to protect the solder slash and prevent short circuit when the component connected to the substrate by the solder.

As to claims 3, 5 and 16, 18, Lauffer as modified by Dshough discloses the pads (138) each having first and second arms and a body, see figure 5.

As to claims 4, 6 and 17, 19, Lauffer as modified by Dshough show the first and second arms are symmetrically (figure 5) and disposed on the substrate with respect to the plated via.

As to claims 7-8 and 20-21, Lauffer as modified by Dshough discloses the pad (138) including a T-shaped structure (see figure 5) having arms being symmetrically disposed on the substrate (12).

As to claims 9-10, 22-24, and 29, Lauffer as modified by Dshough discloses the solder mask(s) being a keyhole or ring shaped partially covered the substrate.

As to claim 26, Lauffer as modified by Dshough discloses a separator along the substrate between the first and second solder masks (53) defined a length of the SMT component (46) soldered.

As to claim 34, Lauffer as modified by Dshough disclose the first conductive pad (138) extended beyond the terminal of the component (46), see figure 6 at maximum distance (end at the solder mask 53) to reduce a solder vicking.

Response to Arguments

Applicant's arguments with respect to claims 1-29 and 34 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

Art Unit: 2841

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reichard Dean can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan T Dinh/

Application/Control Number: 10/774,115

Page 7

Art Unit: 2841

Primary Examiner, Art Unit 2841.